

on many spots of our shores, the lower parts of the ripple-markings often affording coarse sand and broken pieces of shells, so likewise during the Silurian epoch we have circumstances prevailing, such as to show that the sun bleached the empty shells and cracked the dry mud on this ancient sea-beach as it does at the present time.

The evidence of the occurrence of land in formations antecedent to the carboniferous is exceeding rare, the deposits being exclusively of a marine character; and although this deposit at Reaberry Head only affords marine remains, yet the circumstances under which it occurs, and also the state of the fossils which are imbedded in it, leave no doubt that the sea, at the period when this littoral deposit was being formed, rolled over a shore which skirted some portion of land then above the surface of its waters. And it is probable that this land had its fauna and flora, which this withered shell-bed may possibly at some time afford us some knowledge of.—ROBERT HARKNESS.

On the Cell-membrane of Diatomaceous Shells. By J. W. BAILEY.

If hydrofluoric acid is applied to recent Diatomaceæ, the shell soon dissolves, leaving distinct, internal, flexible cell-membranes retaining the general form of the shells. These may sometimes but not generally be detected even in the fossil specimens. When present, they materially interfere with the examination of the true nature of the markings of the siliceous shell, and should be destroyed by nitric acid and heat, before the hydrofluoric acid is employed, unless it is desired to study the cell-membrane itself. There is a curious difference in the action of hydrofluoric acid of the same strength upon specimens of fossil Diatomaceæ from different localities. Some dissolve with even too great rapidity in an acid which is slow and tedious in its action on other specimens. The Bermuda and Richmond Tripoli, and some specimens of fluviatile origin resist the action much longer than is usual with most specimens, whether they are recent marine, or either recent or fossil fluviatile ones. This difference is probably due to different degrees of hydration.—*From Silliman's American Journal of Science and Art*, No. 33, May 1851.

A Comparative Examination of the Objective Glasses of Microscopes from Mr. Ross of England; Mr. Spencer of America; and M. Nachez of Paris. By J. LAWRENCE SMITH, M.D.

Having had an opportunity, a short time since, while at Paris, to examine the comparative merit of the lenses of these makers, it might not be uninteresting to microscopists to know the result of my examination, particularly as it was made under peculiar circumstances; namely, by adapting alternately the objectives to the same mounting, and regarding the same object under the same illumination.

The glasses used were considered by their makers as among their best. That made by Ross was in the possession of M. Rutherford of U. S. Spencer's was owned by Dr. Burnet of Boston, and had just been brought by him from Spencer. That of Nachez belongs to Dr. Bigelow of Boston, now in Europe engaged in microscopic research

very creditable to himself. Their magnifying powers varied from thirteen hundred to fifteen hundred diameters, with an ocular magnifying ten times; Ross's was the feeblest, that of Spencer the strongest.

The angular opening was first measured with great accuracy and found as follows :

| | |
|--------------|------|
| Ross | 145° |
| Spencer..... | 135° |
| Nachez | 120° |

These measurements were all verified by the respective owners of these lenses.

The objects examined were the most difficult test-objects among the siliceous infusoria, as the *Navicula angulata*, one of the species of *Grammatophora*, and a *Navicula* called the *Amici* test. The first two were in balsam.

The lenses were first attached to one of Nachez's mounting, and the best adjustment of oblique light used that this instrument affords. The difference in the effect of the three lenses was very slight, all failing to show the lines on the *Grammatophora* or on the *Amici* test. As notwithstanding the admirable arrangement of Nachez's instrument for working purposes, we do not get the extreme obliquity of light which is required for examining their fine lines, I had them all arranged on a mounting of *Amici*, which furnishes the necessary obliquity of light. Thus arranged, the lines on the *Grammatophora* were distinctly and beautifully seen by all, with slight advantages in favour of Spencer and Ross, the former of which magnified them most.

The *Amici* test was next tried, which resulted in Ross showing the lines with perfect satisfaction; Spencer showing them, but not quite so well; Nachez still less distinctly.

I would remark that this difference between the lenses appears to be owing entirely to difference in the angle of opening, for where a very oblique light is necessary to show lines, the lenses must be so constructed as to admit this light. I would also state that Nachez's system lacks an adjustment which the others have, by which the relative position of the lenses can be changed, so as to compensate for the thickness of the glass which covers the object, and which appears favourable to the examination of those delicate tests. For the examination of globules we could not perceive any appreciable difference between the lenses.

I would here remark in justice to M. Nachez that he deserves much praise for the manner in which he has improved the microscope in France, without augmenting the cost of the instrument, and out of England he is undoubtedly the best maker in Europe. To furnish an idea of what he has done to diminish the cost of a good instrument, I will compare the price of the objectives which have been the subject of the experiments.

| | |
|---------------|-------------|
| Ross..... | 306 francs. |
| Spencer | 230 „ |
| Nachez..... | 60 „ |

And what is still more, he is constantly improving his lenses without adding to their expense.

The lower powers of these makers were examined without finding any sensible difference in the defining effects of them, and what little there was, was in favour of Spencer. The field of the three differed, Nachez's being the least, and Spencer's the greatest. We cannot bestow too much praise on our American maker, for the immense progress which he has made in the construction of objective lenses, and it is to be regretted that he has not chosen a better mounting for them than that of Chevalier, which is very defective and prevents good glasses from showing their best effects.

I had intended making some remarks on oblique light, which has come very much in use lately in observing lines and points on certain objects, but it will be better for me to defer it. I would simply remark that much caution is necessary in using it, as it will not always give correct distances between lines.—*Ib.* No. 32, March 1851.

ANTIOPE CRISTATA.

To the British localities mentioned by Mr. Hancock in last month's Number may be added Langland Bay near Swansea, where my friend, Mr. Moggridge, took a fine specimen in the summer of 1849. It is noticed and figured in that year's Report of the Swansea Literary and Scientific Society under the last recorded name of "*Antiope splendida*."—J. GWYN JEFFREYS, July 6th, 1851.

METEOROLOGICAL OBSERVATIONS FOR JUNE 1851*.

Chiswick.—June 1, 2. Very fine. 3. Fine: cloudy. 4. Cloudy: fine: clear: cold at night. 5. Densely clouded: rain. 6. Boisterous: cloudy and fine. 7. Densely overcast: slight rain. 8. Boisterous. 9. Drizzly. 10. Uniformly overcast: rain. 11. Very fine. 12. Densely clouded: showers. 13. Overcast: densely clouded: rain. 14. Fine: heavy clouds: slight rain. 15. Cloudy: rain. 16. Boisterous. 17. Cloudy and fine. 18. Very fine: boisterous. 19—21. Very fine. 22. Cloudy: clear. 23. Fine: clear and cold at night. 24, 25. Very fine. 26, 27. Hot and very dry. 28, 29. Hot and dry. 30. Slightly clouded.

Mean temperature of the month 59°·21

Mean temperature of June 1850 59°·26

Mean temperature of June for the last twenty-five years . 60°·72

Average amount of rain in June 1·80 inch.

Boston.—June 1, 2. Fine. 3. Fine: rain P.M. 4. Fine. 5—7. Cloudy: rain A.M. and P.M. 8. Cloudy. 9, 10. Cloudy: rain P.M. 11. Fine. 12. Cloudy: rain A.M. 13. Cloudy: rain P.M. 14. Fine. 15. Fine: rain P.M. 16. Cloudy: stormy. 17. Fine: stormy. 18—20. Cloudy. 21. Fine: thunder and lightning, with rain and hail P.M. 22—25. Cloudy. 26—30. Fine.

Sandwich Manse, Orkney.—June 1. Bright: showers. 2. Bright: rain. 3. Clear. 4. Showers: fine. 5. Fine: showers. 6. Fine: clear. 7. Bright: fine. 8. Rain: hazy. 9. Showers: clear. 10. Showers: damp. 11. Showers. 12. Clear: fine. 13. Bright: fine. 14. Fine: hazy. 15. Rain. 16. Rain: drizzle. 17. Showers: clear. 18. Fine: drizzle. 19. Showers: hazy. 20. Fine: clear. 21. Bright: showers. 22. Cloudy. 23. Bright: drizzle. 24. Cloudy. 25. Bright: damp. 26. Cloudy: clear. 27, 28. Clear: fine. 29, 30. Hot: fine.

* The observations from the Rev. W. Dunbar of Applegarth Manse have not reached us.